MAGAZINE SECTION
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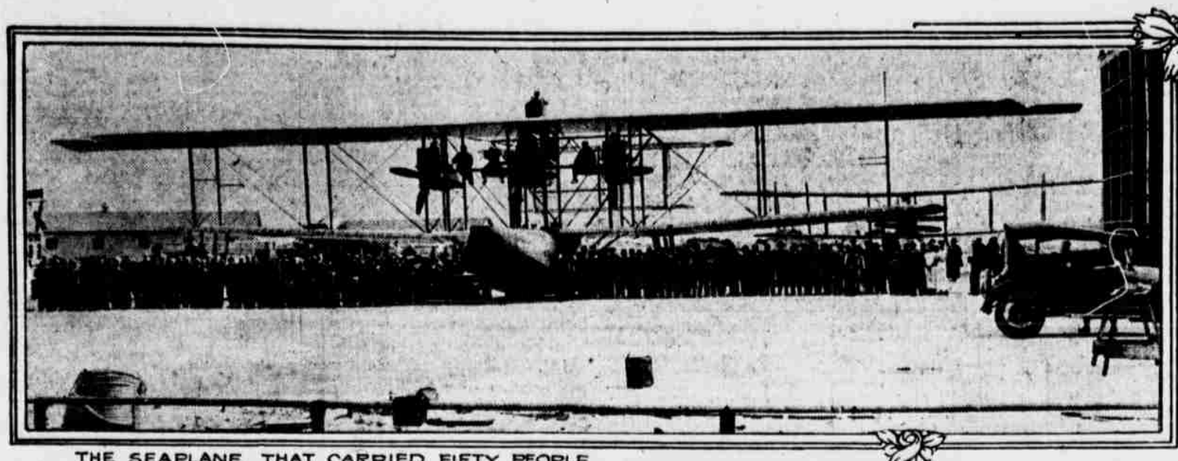
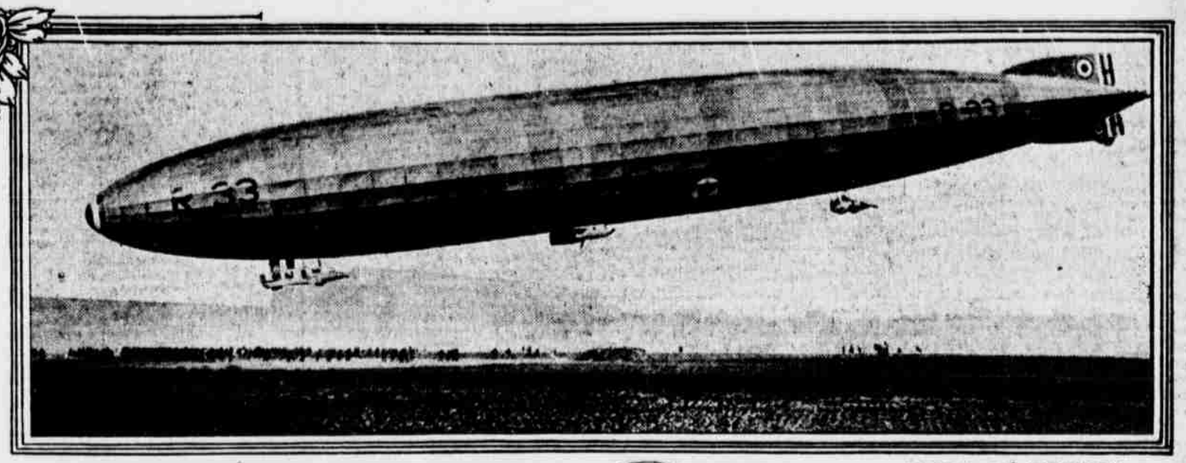
ATLANTIC FLIGHT LIKELY WITHIN 90 DAYS



THE SEAPLANE THAT CARRIED FIFTY PEOPLE RECENTLY.



TYPE of BRITISH DIRIGIBLE that MAY ATTEMPT the FLIGHT.
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Air Experts All Over the World at Work on Plans and Huge Planes Will Soon Be Winging Over the Sea—Three Contestants Expected to Use Liberty Motors in Effort

LIEUT. HARMON

by ERNEST E. HARMON,
1st Lieutenant, U. S. Air Service.

THE contest for the one great flying record of the world is already on. It began on the day when the armistice was signed bringing hostilities to a close in Europe. The transatlantic flight would have been made before this time but for the outbreak of the war, which drew the attention of aeronautic experts to the stern and immediate business of scouting and bombing and fighting over the contending armies.

I should say—and I speak from information as well as from deduction—that four planes built especially for the transatlantic flight will have their trial trips within thirty days. It's a race among the builders to get them done. The planes I mean are the one which our navy is building at the Philadelphia navy yard, the British super Handley-Page machine, the super Caproni, which is being built in Milan, and the multiplane which I am to pilot that is now being assembled at Langley Field, Hampton Roads, Va.

Perhaps the critics of our hasty achievements in preparation for the war will allow us some little credit as engine builders after the flight is accomplished. All but one of the planes will have Liberty motors, and perhaps all of them will. I have been informed that Caproni in Italy is seriously considering the abandonment of the Fiat for the Liberty motor. The British have already adopted the Liberty motor for the super Handley-Page. Capt. Hugo Sundstedt, the Swedish aviator, also has Liberty motors in his plane. It is possible that he may attempt or even accomplish a transatlantic flight, but I do not put him down in the list of high possibilities. He has a biplane with a hundred-foot wing spread and two motors capable of developing a total of 400 horsepower, but it doesn't class with the other planes I have mentioned.

The seaplane which our navy experts are constructing will have a wing spread of 250 feet, and the British super Handley-Page has five Liberty motors to develop 1,000 horse-power.

Glenn Martin told me he was building a machine especially for the transatlantic effort. He said its construction had been rushed and that it was not far from completion. Therefore I should, perhaps, add one more to the list of four planes which are likely to begin tuning up for the cross ocean trip within thirty days.

The Glenn Martin machine is being built at Cleveland, Ohio. It will have only two motors (Liberty). Additional interest is given to Mr. Martin's announcement, since it means that our army as well as our navy will be in the transatlantic competition. Undoubtedly the Glenn Martin flight will be under army direction.

$110,000 in Prizes.

The flight from continent to continent across the Atlantic will be made soon—I should say, possibly, within ninety days. There may be failures first, and some ambitions for a place in history may vanish tragically in an ocean waste, but that will not deter others from going on, because, as any experienced flier can tell you, to fly across the Atlantic is a cinch—if nothing goes wrong. Among the six machines built or building which we know of—and there may be as many more that are being prepared in secret—two, at least, under normally favorable conditions ought to be able to fly across the Atlantic and back again without landing. That feat may furnish the conditions for a contest in a year not far away. Some one is going to fly from America to Europe or Europe to America before midsummer. There's nothing to prevent it. Besides, the bait of an aggregate of about $110,000 in prizes is an inspiration.

The plane which is being built according to the plans of our navy flying experts at the Philadelphia navy yard is simply the best model in the navy multiplied by two in all dimensions. The navy people believed that their seaplane with a wing spread of 125 feet had a good chance to fly across the Atlantic. So, to accomplish the feat surely and certainly, they started building a seaplane just twice as big. No machine with such a wing spread has ever been built, unless it is the British super Handley-Page. The British have a dirigible—a balloon with motors for propulsion—which has already been given trials to determine its probable success in a transatlantic flight. It is, of course, a lighter than air machine. Should it cross the Atlantic the real flight contest between heavier than air machines which actually fly and do not float would still be open and undecided. It is that contest upon which the interest of fliers the world over is centred.

The Italians may be depended upon to produce a machine which will fly across the Atlantic and no doubt they are very nearly ready to make the attempt. In such a flight the problem of carrying enough weight in the shape of crew and supplies is the main factor. Caproni was the first man to experiment with the heavy-weight-carrying ship, and for a while he had undisputed sway in that field.

The new super Caproni must be very nearly finished. Photographs have been shown of its enclosed cabin de luxe and other features. How many motors it is to have and what wing spread, however, are details that are not yet ascertained over here. The Italians, when they projected a transatlantic flight before the war, intended to ship their plane to this side and make the trip home. That was because the prevailing winds favor a flight from west to east.

New Idea in Aircraft.

Naturally, I am inclined to believe that the plane which I am to pilot will have a good chance to win the cross ocean prize. If it meets the expectations of its designer, Mr. Herrman, the Atlantic flight will be an easy thing. It should be able to fly twice the distance without stop. It is now being assembled at Langley Field and will be ready for trial within a month. However, it is constructed according to an entirely new idea and valuable time may be consumed in getting it into satisfactory working order. It is called a multiplane, and it has seven sustaining surfaces. These are arranged, you might say, in ranks. There are a pair of planes in front, three abreast in the middle and two in the rear. The planes are so arranged that the wind streams from each section will not interfere with the lifting power of the other sections. The machine will have five Liberty motors—three tractors and two pushers. Two engines will, it is believed, sustain flight; three certainly. The extreme wing spread, in the centre section, is 114 feet.

There can be very little difference in the plans of the various contenders for the cross ocean prize. Crews will be composed of five, six or possibly seven men. There will be a navigator, a pilot, one or two reserve pilots, two mechanicians and a radio operator. Our multiplane will have a crew of seven, but we shall have three mechanicians and only one reserve pilot.

A landing on the island of Newfoundland would undoubtedly be made for the purpose of taking on final supplies and making the trial trip across as short as possible. But in theory, and very likely in practice, within a year or two it will not be necessary to fly between the two nearest points of America and Europe.

Weather conditions will have everything to do with the success or failure of the flight. I should say, rather, that only phenomenally unfavorable conditions can make the effort a failure. If the aviators make a good guess, or if the Weather Bureau makes it for them, the thing will be positively easy. If the weather doesn't turn out to be just what was expected but is not continuously and completely unfavorable success will be attained. It will take something exceptional in the way of weather to bring disaster.

In the order of their comparative importance the conditions to be considered are wind, clouds, fog and moon. The first is of vastly more importance than the others. The temperature need not be considered at all. Most of the flight will probably be made at an altitude where it is bound to be cold anyway.

To make it clear to readers who are unfamiliar with the practical conditions of aviation I must attempt an explanation of the tremendous importance of a favorable wind.

It should be remembered that when an aeroplane leaves the earth it enters a new medium. Speed is not calculated according to the measurements from point to point of the solid ground. Your ship may be flying sixty miles an hour against the wind and be simply standing still so far as point to point progress is concerned—or even going backward.

Take a contrary condition, when wind favors flight. That's what makes the wonderful speed records from point to point. In the flight from Washington to New York, in which I was fortunate enough to establish a point to point speed record, my average progress over the ground was at the rate of two and three-quarters miles a minute. Yet my speed register showed nothing like that. I had a stiff half-gale at my back practically all of the way. The prevalent winds at most seasons of the year favor a flight from America to Europe. Observation determined long ago that the surface winds move, most of the time, from west to east across the Atlantic. I have found in most of my experience that a steady surface wind means a wind in the same direction higher up, and the higher you go the stronger it is.

The only way to determine the favorable time for the beginning of the transatlantic flight is to have the big plane ready to start and then have a number of exploring planes reporting on the direction and strength of the currents at various altitudes. That's the plan which we shall follow. The advice of meterological experts must be had. Thus, I believe, it will be quite possible to start on the cross-ocean flight with a reasonable assurance that the wind will help.

Clouds as a Factor.

Next in importance—the clouds. The flight must be begun when the clouds are high and cloud vapor is not drifting in great volumes. Of course the weather men can find out pretty well about that. Only by radio communication with ships will it be possible for the flier to know that his position is. It will be necessary for several reasons for the plane to fly at an altitude of about 10,000 feet. With heavy cloud layers below that the surface of the ocean would not be visible and a radio from a ship, giving latitude and longitude would be practically useless.

Considering the number of ships now usual in the steamship lane, the pilot would have a very good chance, if he lost his motor power entirely, to glide down from 10,000 feet, to a spot near enough to one of these ships for the rescue of himself and his crew.

One thing must be absolutely sure—the plane must not fly through rain. To encounter rain for any considerable length of time would be fatal. The ends of the propellor blades of the Liberty motor, or of almost any other motor, move at the rate of ten miles a minute. They are covered with metal or canvas, but neither is a sufficient protection against rain for more than a minute or two. Rain drops cut into the canvas and metal and the wood underneath like pellets of metal. They quickly "nick" the propeller and cause vibration which ruins the engine in no time at all.

The voyage must be made when the moon is at her full. In my judgment, it will be advisable to start at about 3 o'clock of a moonlit night. That will give the advantage of clear sight at the beginning of the voyage and promise a similar advantage at its finish, should calculations go wrong and the landing in Europe have to be made in the night, instead of in the afternoon following the start.

Another fact, which recommends an hour of early night for the start of the flight, is that it creates the probability that motor trouble, if it is going to occur, will develop in the daylight hours, when mechanicians can see to make repairs.

People wonder, no doubt, what could be done should motor trouble develop on the transatlantic plane and what use it will be to take mechanicians along. The answer is that there will be several gas, oil and water tanks on any plane built to fly across the ocean. Should the automatic devices get out of order, skilled mechanicians could make a very fair effort to keep the engines fed by hand, even if they couldn't repair the mechanism.

Then, since most of the transatlantic planes are calculated to sustain flight without their full battery of motors, the mechanicians, equipped with safety belts, could get out to a stopped motor and probably make effective repairs of any minor difficulty such as ignition trouble or water or dirt in a carbureter.

As to the duties of the members of the crew, they should be easily understood. The first pilot, of course, will be at the controls, guiding the ship, taking direction from the navigator and utilizing his flying skill to make the best possible progress. The reserve pilot will rest in the fuselage, sleeping, if possible, so that he shall be perfectly fresh when called to the controls. The navigator should be a man familiar with the transatlantic crossing, so that he may be able to recognize ships and, particularly, be able to give expert advice about selecting a landing place.

The radio man must be an expert and must have a knowledge of several languages. He will also have a radio telephone and should know all about its workings.

The matter of supplies for the trip is hardly worth consideration. In the fuselage there is bound to be ample floor space and this will be provided with blankets and cushions for warmth and comfort. We shall have hot drinks in thermos bottles, brandy, and food sufficient for three meals. There's no use making plans for a longer trip than a day. If the plane doesn't get over in a day it will never get over.

Much more important than food supply is the very vital question of fuel supply. Each Liberty motor consumes from 147 to 167 pounds of fuel per hour, flying at the highest long distance speed. This is not full speed. We will not run our motors at full speed for fear of developing engine trouble. "Fuel" is not perhaps a proper term, for that includes five pounds of water per hour, used for cooling. The allowance of gasolene to each motor is from 22 to 26 gallons per hour, and this will weigh 147 to 167 pounds. There is also about a quart and a half of oil per hour, weighing about 10 pounds.

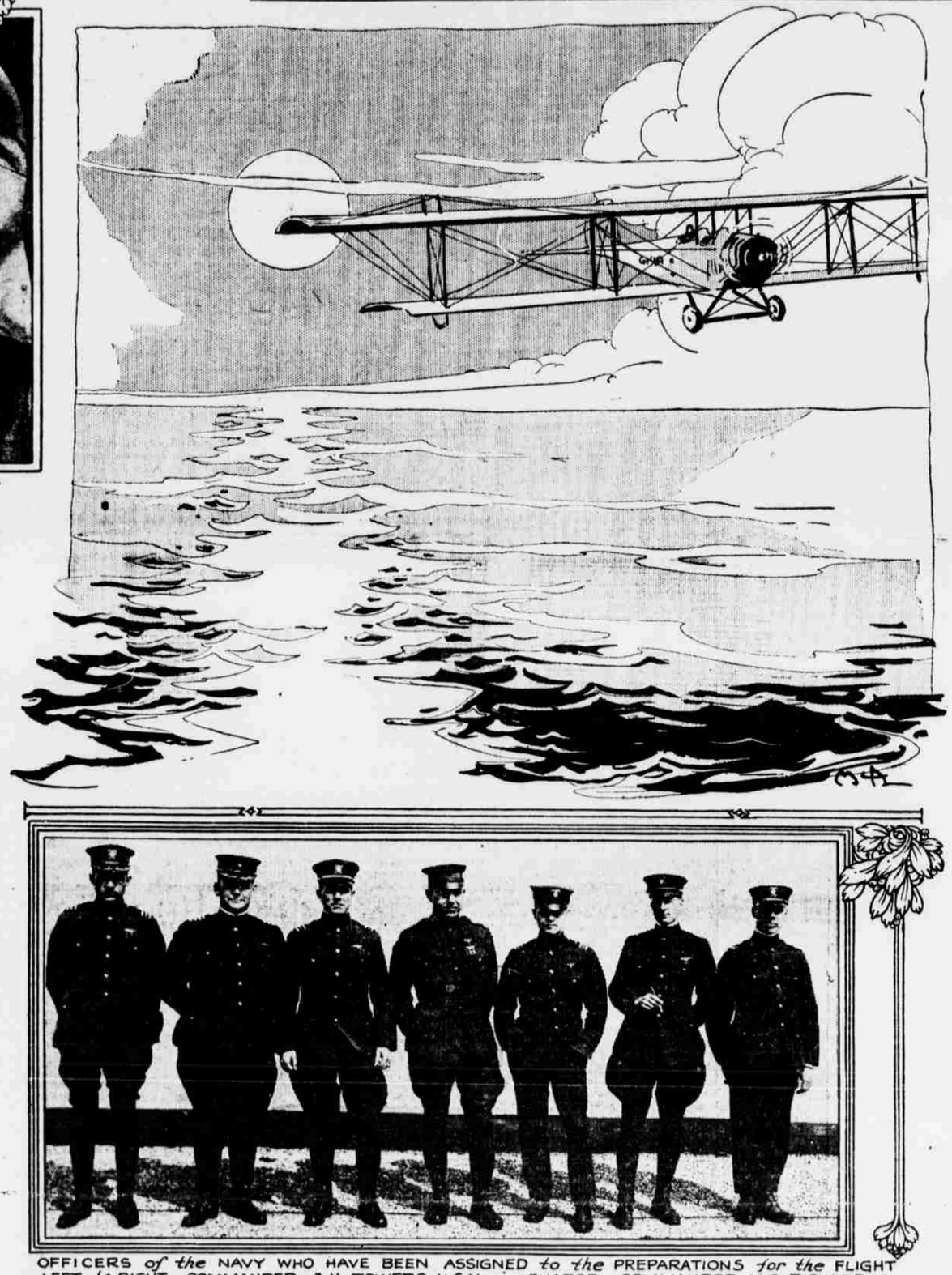
Thus in a fifteen hour flight with five motors running a total of about six tons of fuel would be consumed. Our plane will have a lift of eight tons. The crew will weigh half a ton. We can and will carry enough fuel for an eighteen hour trip. Our gas will be carried in several tanks so as to distribute weight and to prevent the loss of all the fuel should a tank spring a leak. We shall carry equipment to repair a leak, of course, but plan to be able to empty a tank which may be leaking and go on with still sufficient fuel.

The American Government is to me—when it is working—the greatest moral motive power in the world. With Government backing our inventors have just succeeded in the tremendous scientific accomplishment of transmitting the sound of the human voice from America to Europe by means of the radio telephone. It was an American, encouraged by the Government, who laid the first transatlantic cable. A few weeks will decide whether an American will first demonstrate the vast possibilities of commercial air navigation by flying from America to Europe.

Personally I hope and believe that an American will accomplish the feat. I think we're going at it in the right way. The plans of the British aviators now preparing in Newfoundland for the flight strike me as enterprising, but unscientific. At best they will prove if successful that you can fly across the ocean when unexampled good fortune gives results that can only be counted as a happy accident. They will prove that you can fly until your motor stops or your gas runs out, and that if your motor doesn't stop or your gas run out while you are flying over the ocean you can fly from America to Europe. That isn't much to prove. Everybody knows that now.

Our American plans are very different in conception. They are all based upon the principle of motor plurality. That is, our planes built for the trip will all be able to continue flight after one or even two motors have stopped. Our calculations include and absorb the ordinary disadvantages of flight. We are not going to prove that you can possibly do it if you are lucky, but that you can surely do it whenever you wish if you are not unlucky. We propose to establish the beginning of a series of experiments which may reasonably proceed to the demonstration that transatlantic air navigation is no more hazardous than transatlantic water navigation.

Ever since the early days when the pioneers, the Wrights and Langley, experimented with gliders efforts have been toward the adaptation of air flight to practical use. Experimentation was given a tremendous impulse when the world war broke out. Efficient and capable air craft became, instead of curious toys and exhibition freaks, the desirable things that might save nations and make history. The demand at first was for a ship for reconnaissance purposes only. Nobody thought of fighting in the air or from the air. What was wanted was something that would just stay afloat, sufficiently under control to permit the pilot to observe what was beneath him on the earth and report on it when he got back to his base. Then when the idea of the fighting plane was primarily introduced by the scouts who fired at enemy scouts with revolvers and rifles the engineers developed the swift moving, rapid climbing combat ships. Next came the demonstration of the value in warfare of the bomb dropped with something like accuracy from the air and the engineers responded with the giant biplanes of the present time, machines which could carry great weight and make a steady, certain course, even bearing armament for defence.



OFFICERS of the NAVY WHO HAVE BEEN ASSIGNED to the PREPARATIONS for the FLIGHT LEFT to RIGHT. COMMANDER J.H. TOWERS U.S.N. in CHARGE. COMMANDER H.C. RICHARDSON, LT. COMMANDER P.N.L. BELLINGER, MAJOR B.L. SMITH, LT. COMMANDER G. de C. CHEVALIER, LT. COMMANDER R.E BYRD, LT. BARRAT U.S.

Flier Who Will Pilot a Multiplane Expects to Make a Record—Much Depends on the Weather and a Favoring Wind Is Biggest Factor in Trial

American Engineers' Work.

Too much cannot be said for the American engineers who have set out to meet all these demands. They have shown that American inventive genius is still the quickest and most adaptable in the world. Curtiss has given us the best training planes, and recently, fast war types for the army as well as the navy, which cannot be surpassed. He also has designed the giant NC-4, the navy's unequalled weight carrier, the machine which is very likely to accomplish the transatlantic flight. It is a new Curtiss, however, that will make the attempt. Owing to early secretiveness with regard to plans, it has been generally accepted as a fact that one of the NC-4 machines now in use is to attempt the flight. As I said the machine which the navy will actually use has not yet been completed. Glenn Martin has given us the most efficient bomber in the world. No weight carrying machine can approach it in speed and in ability to climb. It can climb 5,000 feet higher than the Handley-Page, the best British machine. Thomas and Moige have given us training scouts that are marvels of efficiency and also the fastest fighting scout ever tested. Loening has turned out the best fighting monoplane ever

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